Remarks

Examiner Goudreau is thanked for the thorough Office Action.

In the Claims

Claims 1, 7 and 12 have been cancelled as; the limitations of claim 1 have been incorporated into amended independent claims 20 and 21; the limitations of claim 7 have been incorporated into amended independent claims 26 and 27; and the limitations of claim 12 have been incorporated into amended independent claims 32 and 33.

Claims 21, 27 and 33 have been amended to include the limitations of their respective base claims 1, 7 and 12 and any intervening claims and are therefore allowable. Claims 2 to 5, 17 to 19 and 22 have been amended to change their dependency from claim 1 to amended independent claim 21 and to correct any inadvertent typographical or editorial errors; claims 8 to 10, 23 to 25 and 28 have been amended to change their dependency from claim 7 to amended independent claim 27 and to correct any typographical errors; and claims 13 to 15, 29 to 31 and 34 have been amended to change their dependency from claim 12 to amended independent claim 33 and to correct any typographical errors and thus claims 2 to 5, 8 to 10, 13 to 15, 17 to 19, 22, 23 to 25, 28, 29 to 31 and 34 are also allowable.

Claims 20, 26 and 32 have been amended to overcome the Examiner's 35 U.S.C. §112, second paragraph, rejections, to correct any inadvertent typographical or editorial errors and have been further amended to include the limitations of their respective base claims 1, 7 and 12 and any intervening claims and are therefore allowable.

Claim Rejections

The Rejection Of Claims 20, 26 and 32 Under 35 U.S.C. §112, Second Paragraph, as Being Indefinite for Failing to Particularly Point Out and Distinctly Claim the Subject Matter Which Applicant Regards as the Invention

The rejection of claims 20, 26 and 32 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention is acknowledged.

Claims 20, 26 and 32 have been amended to overcome the Examiner's 35 U.S.C. §112, second paragraph, rejection as noted above.

The Rejection Of Claims 1 To 5, 7 To 10 and 12 To 15 Under 35 U.S.C. §103(a) as Being Unpatentable Over Soga et al. as Applied in Paragraph 18 of the Previous Office Action

The rejection of claims 1 to 5, 7 to 10 and 12 to 15 under 35 U.S.C. §103(a) as being unpatentable over Soga et al. as applied in paragraph 18 of the previous office action is acknowledged.

The amendments of claims 20, 21; 26, 27; and 32, 33; with the incorporation of the limitations of claims 1; 7; and 12; respectively, the effective cancellation of claims 1, 7 and 12, and the change in dependency of: claims 2 to 5 from amended claim 21; claims 8 to 10 from amended claim 27; and claims 13 to 15 from amended claim 33 obviate this rejection.

The Rejection Of Claims 17 to 19, 22 to 25, 28 to 31 and 34 Under 35 U.S.C. §103(a) as Being Unpatentable Over Soga et al. as Applied in Paragraph 18 of the Previous Office Action

The rejection of claims 17 to 19, 22 to 25, 28 to 31 and 34 under 35 U.S.C. §103(a) as being unpatentable over Soga et al. as applied in paragraph 18 of the previous office action is acknowledged.

The amendments of claims 21, 27 and 33 with the incorporation of the limitations of claims 1, 7 and 12, respectively, the effective cancellation of claims 1, 7 and 12, and the change in dependency of: claims 17 to 19 and 22 from amended claim 21; claims 23 to 25 and 28 from amended claim 27; and claims 29 to 31 and 34 from amended claim 33 obviate this rejection.

Allowable subject matter

The objection to claims 21, 27 and 33 as being dependent upon a respective rejected base claim, but allowable if rewritten in independent form including all of the limitations of the respective base claim and any intervening claims is acknowledged.

Claims 21, 27 and 33 have been so amended to include the limitations of amended claims 1, 7 and 12, respectively as noted above.

The objection to claims 20, 26 and 32 as being dependent upon a respective rejected base claim, but allowable if rewritten in independent form including all of the limitations of the respective base claim and any intervening claims, and if rewritten to overcome the rejection(s) under 35 U.S.C.112, second paragraph, set forth in this Office action, is acknowledged.

Claims 20, 26 and 32 have been so amended to include the limitations of amended claims 1, 7 and 12, respectively, and to overcome the rejection(s) under 35 U.S.C.112, second paragraph, set forth in this Office action as noted above.

Therefore claims 2 to 5, 8 to 10, 13 to 15, and 17 to 34 are allowable and allowance is respectfully solicited.

CONCLUSION

In conclusion, reconsideration and withdrawal of the rejections are respectively requested. Allowance of all claims is requested. Issuance of the application is requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

It is requested that the Examiner telephone Stephen G. Stanton, Esq. (#35,690) at (610) 296 – 5194 or the undersigned attorney at (845) 452 – 5863 if the Examiner has any questions or issues that may be resolved to expedite prosecution and place this Application in condition for Allowance.

Respectively submitted,

George O. Saile

George O. Saile

Reg. No. 19,572

Version with markings to show changes made.

Claims 1, 7 and 12 have been cancelled.

Please amend the claims as follows:

2. (Amended) The method of claim 21 [1] wherein the substrate is employed within a microelectronic fabrication selected from the group consisting of integrated circuit microelectronic fabrications, ceramic substrate microelectronic fabrications, solar cell optoelectronic microelectronic fabrications, sensor image array optoelectronic microelectronic fabrications and display image array optoelectronic microelectronic fabrications.

3. (Amended) The method of claim 21 [1] wherein the silicon layer is selected from the group consisting of monocrystalline silicon layers, polycrystalline silicon layers and amorphous silicon layers.

4. (Amended) The method of claim 21 [1] wherein:

the silicon layer is masked with a mask layer, and

the mask layer is selected from the group consisting of silicon containing dielectric hard mask layers and photoresist mask layers.

5. (Amended) The method of claim 21 [1] wherein the seasoning polymer layer is formed of a material selected from the group consisting of:

silicon and bromine containing seasoning polymer materials;

silicon, bromine and oxygen containing seasoning polymer materials;

silicon and chlorine containing seasoning polymer materials;

silicon, chlorine and oxygen containing seasoning polymer materials;

silicon, bromine and chlorine containing seasoning polymer materials; and

silicon, bromine, chlorine and oxygen containing seasoning polymer materials.

8. (Amended) The method of claim 27 [7] wherein the substrate is employed within a microelectronic fabrication selected from the group consisting of integrated circuit microelectronic fabrications, ceramic substrate microelectronic fabrications, solar cell optoelectronic microelectronic fabrications, sensor image array optoelectronic microelectronic fabrications and display image array optoelectronic microelectronic fabrications.

9. (Amended) The method of claim 27 [7] wherein:

the first monocrystalline silicon layer is masked with a mask layer; and

the mask layer is selected from the group consisting of silicon containing dielectric hard mask layers and photoresist mask layers.

10. (Amended) The method of claim 27 [7] wherein the seasoning polymer layer is formed of a material selected from the group consisting of:

silicon and bromine containing seasoning polymer materials;

silicon, bromine and oxygen containing seasoning polymer materials;

silicon and chlorine containing seasoning polymer materials;

silicon, chlorine and oxygen containing seasoning polymer materials;

silicon, bromine and chlorine containing seasoning polymer materials; and

silicon, bromine, chlorine and oxygen containing seasoning polymer materials.

13. (Amended) The method of claim 33 [12] wherein the substrate is employed within a microelectronic fabrication selected from the group consisting of integrated circuit microelectronic fabrications, ceramic substrate microelectronic fabrications, solar cell optoelectronic microelectronic fabrications, sensor image array optoelectronic microelectronic fabrications and display image array optoelectronic microelectronic fabrications.

14. (Amended) The method of claim 33 [12] wherein:

the polycrystalline silicon layer is masked with a mask layer; and

the mask layer is selected from the group consisting of silicon containing dielectric hard mask layers and photoresist mask layers.

15. (Amended) The method of claim 33 [12] wherein the seasoning polymer layer is formed of a material selected from the group consisting of:

silicon and bromine containing seasoning polymer materials;

silicon, bromine and oxygen containing seasoning polymer materials;

silicon and chlorine containing seasoning polymer materials;

silicon, chlorine and oxygen containing seasoning polymer materials;

silicon, bromine and chlorine containing seasoning polymer materials; and

silicon, bromine, chlorine and oxygen containing seasoning polymer materials.

17. (Amended) The method of claim 21 [1], wherein the dummy wafer seasoning methods include a method selected from the group consisting of:

i) a silicon oxide coated dummy wafer method;

ii) a silicon oxide coated dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas; and

iii) a silicon dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas.

18. (Amended) The method of claim 21 [1], wherein the dummy wafer seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 1 to 500 mTorr;

a source radio frequency power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a dummy wafer temperature of from about 20 to 200°C;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

19. (Amended) The method of claim 21 [1], wherein the product wafer in-situ seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a product substrate temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

20. (Amended) A method for forming an etched silicon layer comprising:

providing a first substrate having formed thereover a first silicon layer;

etching the first silicon layer to form an etched first silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides at least one of an active bromine containing etchant species and an active chlorine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless seasoning methods; [The method of claim 1,] wherein the waferless seasoning methods[, when using an eight inch diameter substrate,] employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

[a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;]

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds; [.]

(2) the first silicon layer is etched to form the etched first silicon layer within the seasoned plasma reactor chamber; and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first silicon layer to form the etched first silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second silicon layer to form an etched second silicon layer formed over the second substrate within the plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

21. (Amended) A method for forming an etched silicon layer comprising:

providing a first substrate having formed thereover a first silicon layer;

etching the first silicon layer to form an etched first silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides at least one of an active bromine containing etchant species and an active chlorine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless seasoning methods;

(2) the first silicon layer is etched to form the etched first silicon layer within the seasoned plasma reactor chamber; [The method of claim 1,] wherein the first silicon layer etch step, when using an eight inch diameter substrate, employs:

a reactor chamber pressure of from about 1 to 500 mTorr;

a radio frequency source power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz and an external bias power of up to about 500 watts;

a substrate temperature and a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a hydrogen bromide flow rate of from about 10 to 200 sccm;

an oxygen flow rate of from about 1 to 50 sccm;

a nitrogen trifluoride flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss;[.] and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first silicon layer to form the etched first silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second silicon layer to form an etched second silicon layer formed over the second substrate within the plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

22. (Amended) The method of claim 21 [1], wherein the seasoned plasma reactor chamber cleaning step, when using an eight inch diameter substrate, employs:

a seasoned plasma reactor chamber pressure of from about 50 to 500mTorr;

a source radio frequency power of from about 100 to 200 watts at a source radio frequency of from about 2 to 13.56 MHz and a bias power of up to about 500 watts;

a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a nitrogen trifluoride or a sulfur hexafluoride flow rate of from about 10 to 500 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss.

23. (Amended) The method of claim 27 [7], wherein the dummy wafer seasoning methods include a method selected from the group consisting of:

i) a silicon oxide coated dummy wafer method;

ii) a silicon oxide coated dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas; and

iii) a silicon dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas.

24. The method of claim 27 [7], wherein the dummy wafer seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 1 to 500 mTorr;

a source radio frequency power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a dummy wafer temperature of from about 20 to 200°C;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

25. The method of claim 27 [7], wherein the product wafer in-situ seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a product substrate temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

26. (Amended) A method for forming an etched monocrystalline silicon layer comprising:

providing a first substrate having formed thereover a first monocrystalline silicon layer;

etching the first monocrystalline silicon layer to form an etched first monocrystalline silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides at least one of an active bromine containing etchant species and an active chlorine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless

seasoning methods; [The method of claim 7,] wherein the waferless seasoning methods[, when using an eight inch diameter substrate,] employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

[a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;]

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds ; [.]

(2) the first monocrystalline silicon layer is etched to form the etched first monocrystalline silicon layer within the seasoned plasma reactor chamber; and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first monocrystalline silicon layer to form the etched first monocrystalline silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second monocrystalline silicon layer to form an etched second monocrystalline silicon layer formed over the second substrate within the

plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

27. (Amended) A method for forming an etched monocrystalline silicon layer comprising:

providing a first substrate having formed thereover a first monocrystalline silicon layer;

etching the first monocrystalline silicon layer to form an etched first monocrystalline silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides at least one of an active bromine containing etchant species and an active chlorine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless seasoning methods;

(2) the first monocrystalline silicon layer is etched to form the etched first monocrystalline silicon layer within the seasoned plasma reactor chamber; [The method of claim 7,] wherein the first monocrystalline silicon layer etch step, when using an eight inch diameter substrate, employs:

a reactor chamber pressure of from about 1 to 500 mTorr;

a radio frequency source power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz and an external bias power of up to about 500 watts;

a substrate temperature and a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a hydrogen bromide flow rate of from about 10 to 200 sccm;

an oxygen flow rate of from about 1 to 50 sccm;

a nitrogen trifluoride flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss;[.] and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first monocrystalline silicon layer to form the etched first monocrystalline silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second monocrystalline silicon layer to form an etched second monocrystalline silicon layer formed over the second substrate within the plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

28. The method of claim 27 [7], wherein the seasoned plasma reactor chamber cleaning step, when using an eight inch diameter substrate, employs:

a seasoned plasma reactor chamber pressure of from about 50 to 500mTorr;

a source radio frequency power of from about 100 to 200 watts at a source radio frequency of from about 2 to 13.56 MHz and a bias power of up to about 500 watts;

a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a nitrogen trifluoride or a sulfur hexafluoride flow rate of from about 10 to 500 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss.

29. The method of claim 33 [12], wherein the dummy wafer seasoning methods include a method selected from the group consisting of:

i) a silicon oxide coated dummy wafer method;

ii) a silicon oxide coated dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas; and

iii) a silicon dummy wafer method in conjunction with the seasoning plasma etch method additionally employing an oxygen containing etchant gas.

30. The method of claim 33 [12], wherein the dummy wafer seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 1 to 500 mTorr;

a source radio frequency power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a dummy wafer temperature of from about 20 to 200°C;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

31. The method of claim 33 [12], wherein the product wafer in-situ seasoning methods, when using an eight inch diameter substrate, employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature and a product substrate temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds.

32. (Amended) A method for forming an etched polycrystalline silicon layer comprising:

providing a first substrate having formed thereover a first polycrystalline silicon layer;

etching the first polycrystalline silicon layer to form an etched first polycrystalline silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides an active bromine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless seasoning methods; [The method of claim 12,] wherein the waferless seasoning methods[, when using an eight inch diameter substrate,] employ:

a plasma reactor chamber pressure of from about 50 to 1000 mTorr;

a source radio frequency power of from about 10 to 1000 watts at a source radio frequency of from about 2 to 13.56 MHz;

a plasma reactor chamber temperature of from about 20 to 200°C;

a silicon containing seasoning polymer layer forming gas flow rate of from about 1 to 200 sccm;

a bromine and/or chlorine containing etchant gas flow rate of from about 10 to 200 sccm;

an optional oxygen containing etchant gas flow rate of from about 1 to 50 sccm;

[a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm;]

a magnetic field of up to about 200 gauss; and

a plasma seasoning time of from about 5 to 120 seconds; [.]

(2) the first polycrystalline silicon layer is etched to form the etched first polycrystalline silicon layer within the seasoned plasma reactor chamber; and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first polycrystalline silicon layer to form the etched first polycrystalline silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second polycrystalline silicon layer to form an etched second polycrystalline silicon layer formed over the second substrate within the plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

33. (Amended) A method for forming an etched polycrystalline silicon layer comprising:

providing a first substrate having formed thereover a first polycrystalline silicon layer;

etching the first polycrystalline silicon layer to form an etched first polycrystalline silicon layer while employing a plasma etch method employing a plasma reactor chamber in conjunction with a plasma etchant gas composition which upon plasma activation provides an active bromine containing etchant species, wherein within the plasma etch method:

(1) a cleaned plasma reactor chamber is seasoned to provide a seasoned plasma reactor chamber having a seasoning polymer layer formed therein; wherein the seasoning method is selected from the group consisting of dummy wafer seasoning methods, product wafer in-situ seasoning methods and waferless seasoning methods;

(2) the first polycrystalline silicon layer is etched to form the etched first polycrystalline silicon layer within the seasoned plasma reactor chamber; [The method of claim 12,] wherein the first polycrystalline silicon layer etch step, when using an eight inch diameter substrate, employs:

a reactor chamber pressure of from about 1 to 500 mTorr;

a radio frequency source power of from about 10 to 2000 watts at a source radio frequency of from about 2 to 13.56 MHz and an external bias power of up to about 500 watts;

a substrate temperature and a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a hydrogen bromide flow rate of from about 10 to 200 sccm;

an oxygen flow rate of from about 1 to 50 sccm;

a nitrogen trifluoride flow rate of from about 1 to 50 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss;[.] and

(3) the seasoning polymer layer is cleaned from the seasoned plasma reactor chamber to provide the cleaned plasma reactor chamber after etching the first polycrystalline silicon layer to form the etched first polycrystalline silicon layer within the seasoned plasma reactor chamber prior to etching a second substrate having formed thereover a second polycrystalline silicon layer to form an etched second polycrystalline silicon layer formed over the second substrate within the plasma reactor chamber while employing the plasma etch method in accord with (1), (2) and (3).

34. The method of claim 33 [12], wherein the seasoned plasma reactor chamber cleaning step, when using an eight inch diameter substrate, employs:

a seasoned plasma reactor chamber pressure of from about 50 to 500mTorr;

a source radio frequency power of from about 100 to 200 watts at a source radio frequency of from about 2 to 13.56 MHz and a bias power of up to about 500 watts;

a seasoned plasma reactor chamber temperature of from about 20 to 200°C;

a nitrogen trifluoride or a sulfur hexafluoride flow rate of from about 10 to 500 sccm;

a backside cooling gas pressure of from about 1 to 50 torr and a flow rate of from about 2 to 50 sccm; and

a magnetic field of up to about 200 gauss.